

## REMARKS

Claims 1-3, 6-8, 13-16, 18-21, 22, and 24 have been changed by this amendment. No new claims have been added. Claims 1-24 remain in the application.

The examiner cited six US patents in rejecting applicants' claims. They are identified in this amendment as follows:

Boren: US Patent 5226057(A) to Boren  
Morris: US Patent 6032033(A) to Morris et al.  
Hiramatsu: US Patent 6600933(B1) to Hiramatsu et al.  
Dehghan: US Patent 6782043(B1) to Dehghan et al.  
Kawaguchi: US Patent 6873835(B2) to Kawaguchi  
Affes: US Patent 6975666(B2) to Affes et al.

**NOTATION USED BELOW** – *Applicants' specification lacks line numbers. For purposes of this amendment, reference is made to "page X, LFT" or "page Y, LFB", in which LFT means lines from the top of the page and LFB means lines from the bottom of the page.*

**Claims 1, 4, and 5 were rejected under 35 U.S.C. 103(a) as being unpatentable over Boren in view of Kawaguchi**

A phrase of claim 1 that includes a description of the generation of at least one complex symbol value is modified by this amendment to read "each complex symbol value of the at least one complex symbol value being normalized by a function based on at least one channel coefficient associated with each of the plurality of propagation channels"

The examiner stated that Boren teaches normalizing transmitted symbol values over one or more channel coefficients and refers to the filters 25 (a low pass filter), and 35 (a notch filter coupled) with 33 (a coefficient adaptor) in 31 (an adaptive notch filter) of FIG. 1 of Boren.

Page 3, 5 LFB to page 6, 2 LFT of applicants' specification states:

“The complex symbol values transmitted from each transmitter antenna **TX**<sub>0</sub>-**TX**<sub>2</sub> are weighted versions of modulation symbol  $s_j$  where the weights are a function of the receiver antenna among the receiver antennas **RX**<sub>0</sub>-**RX**<sub>2</sub> selected to receive the complex symbol values, and the propagation channels between the  $M_T$  transmitter antennas and the  $M_R$  candidate receiver antennas. The result is a normalization of the complex symbol values over the channel coefficients associated with the propagation channels.”

Page 5, 3-7 LFT of applicants' specification states:

“...  $h_{i,j}$  is a complex-valued channel coefficient [for a propagation channel from transmitter j to receiver i]. For this particular implementation, each of the complex-valued baseband-equivalent channels connecting the transmitter antennas **TX**<sub>0</sub>-**TX**<sub>2</sub> with each of the receiver antennas **RX**<sub>0</sub>-**RX**<sub>2</sub> are assumed to comprise a single coefficient (conventionally referred to as a ‘flat’ channel).”

It is well known to those of ordinary skill in the art that the channel coefficients associated with a propagation channel are coefficients that specify the gain of the propagation channel versus frequency. This well known aspect is reinforced by the general description on page 3 and the description of one implementation on page 5. The low pass filter 25 of Boren is described at column 2, lines 5-10 as “reducing by 140 db or more all frequencies above the anticipated top frequency of the intelligence.” Thus, it does not characterize the propagation channel. The notch filters have adaptive coefficients that are adjusted to “reduce or eliminate narrowband interference”. Thus, these coefficients do not characterize the gain of the propagation channel, and Boren does not describe applicants' channel coefficients claimed in claim 1.

Furthermore, amended claim 1 requires that the at least one complex symbol value be normalized by a function based on at least one channel coefficient associated with each of the plurality of propagation channels. Thus, channel coefficients associated with at least two propagation channels must be included in the normalization function. Neither Boren nor Kawaguchi describes this aspect.

#### CONCLUSION

Therefore applicants believe that claim 1 is patentable over the combination of Boren and Kawaguchi, and furthermore, applicants believe that claim 1 is patentable over all the prior art cited in this application, either singly or in combination. Because claims 4 and 5 each depend from claim 1, applicants believe

that claims 4 and 5 are also patentably distinct from the prior art cited in this application, either singly or in combination.

Claim 6 was rejected under 35 U.S.C. 103(a) as being unpatentable over Hiramatsu in view of Morris

Claims 9-12 were rejected under 35 U.S.C. 103(a) as being unpatentable over Hiramatsu in view of Morris and further in view of Kawaguchi

Claim 6 is modified in a manner similar to claim 1. The examiner states that Morris teaches a slicer 230 that has channel filter coefficients over which the noise is removed and the signal normalized and has also stated that a slicer is a filter and therefore it has coefficients. As stated in applicants arguments for claim 1 channel coefficients for propagation channels are well known in the art. To those of ordinary skill in the art, a slicer is a nonlinear device that operates using a voltage threshold to generate a binary output from an analog input. Applicants believe that those of ordinary skill in the art do not include a threshold or any other parameters of a slicer in the definition of a channel coefficient of a propagation channel. Morris does not indicate that the slicer 230 has any channel coefficients as inputs. The term coefficient is understood by those of ordinary skill in the art as something that modifies a value by multiplication. A slicer does not perform multiplication.

Furthermore, amended claim 6 requires the use of at least one channel coefficient associated with at least two propagation channels. Thus, channel coefficients associated with at least two propagation channels must be included in the normalization function. Neither Hiramatsu nor Morris describes this aspect.

#### CONCLUSION

Therefore applicants believe that claim 6 is patentable over the combination of Hiramatsu and Morris, and furthermore, applicants believe that claim 6 is patentable over all the prior art cited in this application, either singly or in combination. Because claims 9-12 each depend from claim 6, applicants believe that claims 9-12 are also patentably distinct from the prior art cited in this application, either singly or in combination.

Claim 16 was rejected under 35 U.S.C. 103(a) as being unpatentable over Kawaguchi in view of Affes

Claim 17 was rejected under 35 U.S.C. 103(a) as being unpatentable over Kawaguchi in view of Dehghan

The computing of a vector norm has been changed in claim 16 to read “computing a vector norm for each particular receiver antenna of the plurality of receiver antennas of the receiving device based on a vector comprising measured, complex channel coefficients associated with the one or more propagation channels that include the particular antenna”.

It is well known to those of ordinary skill in the art that a vector norm is defined in general as  $|\mathbf{x}|_p \equiv \left( \sum_i |x_i|^p \right)^{1/p}$ , wherein  $x_i$  are the coordinate values of the vector, and  $p$  is an integer greater than 0. (See, for example “vector norm” located at [mathworld.wolfram.com](http://mathworld.wolfram.com) in the .com domain of the internet). A commonly used vector norm is one in which  $p = 2$ , as used in particular embodiments described in applicant’s specification.

The art cited does not describe a vector norm based on a vector comprising measured, complex channel coefficients associated with the one or more propagation channels that include the particular antenna.

Therefore applicants believe that claim 16 is patentable over the combination of Kawaguchi and Affes, and furthermore, applicants believe that claim 16 is patentable over all the prior art cited in this application, either singly or in combination. Because claim 17 depends from claim 16, applicants believe that claim 17 is also patentably distinct from the prior art cited in this application, either singly or in combination.

Claims 13 and 19 were rejected under 35 U.S.C. 102(e) as being anticipated by Kawaguchi

Claims 13 and 19 have been amended to more clearly state the invention. Average injection power is a term used in applicants' specification to refer to an average transmitted power that is injected into the selected channel, as described in applicants' specification, page 5, last line to page 6, 3<sup>rd</sup> line. The fact that the average injection power is a transmitted power is sufficient to overcome the examiner's argument. Applicants believe that amended claims 13 and 19 are patentable over all the prior art cited in this application, either singly or in combination.

Claim 22 was rejected under 35 U.S.C. 102(e) as being anticipated by Kawaguchi

Claim 23 was rejected under 35 U.S.C. 103(a) as being unpatentable over Kawaguchi in view of Dehghan

Kawaguchi does not describe a vector norm based on a vector comprising measured, complex channel coefficients associated with the one or more propagation channels that include the particular antenna.

Therefore applicants believe that claim 22 is patentable over Kawaguchi, and furthermore, applicants believe that claim 22 is patentable over all the prior art cited in this application, either singly or in combination. Because claim 23 depends from claim 22, applicants believe that claim 23 is also patentably distinct from the prior art cited in this application, either singly or in combination.

The allowed claims were rewritten to be dependent upon the amended form of the independent claims to which they were originally made dependent.

Closing Remarks

Applicant notes that any amendments or claim cancellations made herein and not substantively discussed above are made solely for the purposes of more clearly and particularly describing and claiming the invention, and not for purposes of overcoming art. The Examiner should infer no (i) adoption of a position with respect to patentability, (ii) change in the Applicant's position with respect to any claim or subject matter of the invention, or (iii) acquiescence in any way to any position taken by the Examiner, based on such amendments or cancellations not substantively discussed. Furthermore, any remarks made herein with respect to a given claim or amendment are intended only in the context of that specific claim or amendment, and should not be applied to other claims, amendments, or aspects of Applicant's invention.

Applicant specifically reserves the right to prosecute claims of differing and broader scope than those presented herein, in a continuation application.

The Applicants believe that the subject application, as amended, is in condition for allowance. Such action is earnestly solicited by the Applicants.

In the event that the Examiner deems the present application non-allowable, it is requested that the Examiner telephone the Applicant's attorney or agent at the number indicated below so that the prosecution of the present case may be advanced by the clarification of any continuing rejection.

Please charge any fees associated herewith, including extension of time fees, to 502117.

Respectfully submitted,

SEND CORRESPONDENCE TO:

Motorola, Inc.  
1303 East Algonquin Road  
IL01/3<sup>rd</sup> Floor  
Schaumburg, IL 60196  
Customer Number: 22917

By: /James A. Lamb/  
James A. Lamb  
Attorney of Record  
Reg. No.: 38,529  
  
Telephone: 847-576-5054  
Fax No.: 847-576-3750